Atty. Dkt. No. 029319-0201

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Jay A. Haines

Title: INFRARED REFLECTIVE WALL PAINT

Appl. No.: 10/811,065

Filing Date: 3/26/2004

Examiner: Markham, Wesley D.

Art Unit: 1762

Conf. No.: 8080

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date below.

(Printed Name)

(Signature)

(Date of Deposit)

DECLARATION OF JAY A. HAINES UNDER 37 C.F.R. §§ 1.131-1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Jay A. Haines, declare as follows:

1. I am the inventor of the above-referenced patent application and the subject matter described and claimed therein.

2. I am President of Textured Coatings of America, Inc., which manufactures the paints disclosed in the above-referenced patent application.

3. I have read the specification and claims for the above-referenced patent application.

4. I have read the Office Action dated February 7, 2006, for the above-reference application, and I understand that January 2004 is the date of a reference cited by the Examiner entitled "There Goes the Sun." (*Painting & Wallcovering Contractor*, January/February 2004, pp. 53-54 and 68.)

5. Prior to January 2004, I conceived the idea of a method of reducing the energy consumption in a building by coating its external vertical walls with a paint that has at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure. According to my invention, the surface temperature of a wall coated with this wall paint is lowered relative to the surface temperature of a wall coated with a wall paint of the same color which lacks the heat-reflective metal oxide pigment, and in turn less energy is required to cool the building. See specification at paragraph **[0018]**, **[0035]**, and **[0067]**. This invention is reflected in the specification and claims of the above mentioned patent application.

6. Subsequent to conceiving the idea of the above invention, I commenced a series of experiments to establish that the inventive methods involving painting external vertical walls of a building with heat reflective paints which comprise at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure would result in reduced energy consumption required to cool the building.

7. As a first step in this process, we (i.e., I and Textured Coatings of America, Inc.) made novel heat reflecting wall paints with at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure in accordance with my invention. These paints were made prior to January 2004. To my knowledge, these were the first wall paints made with at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure.

8. I submit the following evidence to show that we made paint with at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure prior to January 2004. Exhibit 4 is an invoice from Tavco Chemicals Incorporated dated prior to January 2004. This document is a true and complete copy of the invoice, except that dates within the invoice have been redacted. I attest that all of the redacted dates are earlier than January 2004. Tavco Chemical Incorporated (i.e., "Tavco,") located at 25401 Cabot Rd., Suite 121, Laguna Hills, CA 92653, is a distributor of specialized chemicals to

the paint industry. I attest that the four items listed in Exhibit 4, i.e., CMD3137 Aqueous V-9416 Yellow, CMD5041 Aqueous V12600 Cam Grn, CMD6077 Aqueous V9248 Blue, and CMD3138 Aqu V-10415 ATM Gold, refer to heat reflective metal oxide pigments which comprise a solid solution having a corundum-hematite crystal lattice structure that were used in paints manufactured by Textured Coatings of America, Inc. This receipt demonstrates that Textured Coatings of America, Inc. had purchased the metal oxide pigments of paints of my invention prior to January 2004. Attached hereto as Exhibit 5 is a production ticket of a paint manufacturing run conducted at Textured Coatings of America, Inc. prior to January 2004. This document is a true and complete copy of the production ticket, except that dates within it have been redacted as well as certain proprietary information. I attest that all of the redacted dates are earlier than January 2004. Exhibit 5, which is production ticket W19782, lists the actual manufacturing record of lot 31117-229 of Tex Cote Platinum SuperCote Antique Ivory paint. I attest that the term "IR colorants" on the production ticket is an in-house manufacturing term and refers to heat reflective metal oxide pigments which comprise a solid solution having a corundum-hematite crystal lattice structure. This production ticket demonstrates that the novel paints of my invention were manufactured by us prior to January 2004.

9. As a next step in the process of demonstrating the effectiveness of the method of my invention, we performed experiments to determine whether surfaces painted with our novel paints comprising at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure would reflect heat better than surfaces painted with wall paint of the same color lacking heat reflective metal oxide pigments which comprise a solid solution having a corundum-hematite crystal lattice structure (thus resulting in a lowered surface temperature of the surfaces painted with our novel paints.)

10. I submit the following evidence to show we successfully performed such experiments demonstrating the profound heat reflective properties of our novel paints prior to January 2004. Exhibit 3 is a memorandum from PRI Asphalt Technologies to Eileen Dutton of Textured Coatings of America, Inc., dated prior to January 2004. This document is a true and complete

copy of the memorandum, except that dates within the memorandum have been redacted. I attest that all of the redacted dates are earlier than January 2004. PRI Asphalt Technologies is a certified testing laboratory located at 6408 Badger Drive, Tampa, FL 33610-2004. Textured Coatings of America, Inc. had contracted with PRI Asphalt Technologies prior to January 2004 to measure the solar reflectance and infrared emittance of four panels coated with different paints (Exhibit 3, page 1, paragraph 3): (1) Competitor High Quality Gray, (2) TexCote SuperCote Gray, (3) Competitor High Quality Tan, and (4) TexCote SuperCote Tan paint. The Tex Cote SuperCote paints (i.e., samples 2 and 4) are novel heat reflective paints manufactured by Textured Coatings of America, Inc., containing at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure. The Competitor paints were of the same color but lacked heat reflective metal oxide pigments which comprise a solid solution having a corundum-hematite crystal lattice structure. The results of PRI Asphalt Technologies analyses (Exhibit 3, page 2) show that the average solar reflectance of samples (1)-(4) is 26.8, 50.3, 36.5, and 49.9, respectively. Thus, these data show that the novel Tex Cote SuperCote paints having at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure are strikingly higher in solar reflectance than paints of the same color that lack the heat reflective metal oxide pigments which comprise a solid solution having a corundum-hematite crystal lattice structure. These results demonstrate that prior to January 2004, Textured Coatings of America, Inc. had manufactured novel paints and demonstrated that the paints were effective in reflecting heat, thus reducing surface temperature.

11. The next step of reducing the inventive methods to practice involved painting the external vertical walls of a building with the novel Tex Cote SuperCote heat reflecting wall paint having at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure to reduce energy consumption associated with cooling. Attached hereto as Exhibit 2 is a photograph of a residence in Panama City, Florida with the external walls painted with the novel Tex Cote SuperCote heat reflecting wall paint having at least one heat reflective metal oxide pigment which comprises a solid solution having a

corundum-hematite crystal lattice structure. I attest that this house was painted prior to January 2004 with Tex Cote SuperCote paint which has the claimed metal oxide pigment of my invention. Thus this painted building demonstrates that my invention was literally reduced to practice prior to January 2004.

12. Prior to January 2004, analyses were conducted which demonstrate the energy reduction resulting from the methods of my invention. Specifically, Eley Associates was contracted to calculate the energy savings for a house painted according to the method of my invention. Eley Associates, now Architectural Energy Corporation, is an energy engineering firm concerned with energy, buildings, and the environment, with offices at 2540 Frontier Avenue, Suite 201, Boulder, Colorado 80301, (303) 444-4149. In this regard, computer comparisons of the energy usage of a 45' x 45' single family, single story, detached home were conducted. In one model, Tex Cote SuperCote Gray was used, and in the other model Competitor High Quality Gray paint was used on the external side walls of the homes in two climate locations, Los Angeles and Miami. Our experimental data from the studies described in paragraphs 9 and 10 above established the absorptance (i.e., incident radiation which was not reflected) for Tex Cote SuperCote Gray (novel heat reflecting paint having at least one of the claimed pigments) is 0.497, and the absorptance of competitor paint of the same color lacking the inventive pigments is 0.732. Both paints have an emissivity of 0.88. The models used these absorptance and emissivity values as well as historic weather data and assumptions concerning wall construction, roof construction, number of people, lighting power density, equipment power density, air infiltration, and heating and cooling system set points which reasonably represent the test house in a real world simulation. The historic weather data was obtained from the database maintained by the United States National Renewable Energy Laboratory. The wall construction was fully grouted CMU (i.e., concrete-masonry-unit) walls with 1" stucco (Los Angeles) and wood framed walls with R-11 batt insulation (Miami.) Four people were assumed to occupy the homes. The lighting power density was assumed to be 0.60 W/sq-ft. The equipment power density was assumed to be 0.75 W/sq-ft. The infiltration rate was assumed to be 0.3 air changes per hour. The HVAC (i.e., heating, ventilation and air conditioning) system was of the residential type,

operated on a 24-hr heating/cooling schedule, with cooling and heating set points of 76 °F and 68 °F, respectively.

13. Attached hereto as Exhibit 1 is a memorandum from Aditi Raychoudhury of Eley Associates to Eileen Dutton of Textured Coatings of America, Inc., dated prior to January 2004, which describes the methods and results of the analyses described in paragraph 12 above. This document is a true and complete copy of the memorandum, except that dates within the memorandum have been redacted. I attest that all of the redacted dates are earlier than January 2004. In Exhibit 1, the term "Tex Cote SuperCore Gray textured coating" is the wall paint of my invention which contains at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure.

14. As summarized in Exhibit 1 (page 4) energy consumption is reduced in a building painted according to my invention compared to Competitor high quality gray coating. The percentage savings was calculated to be 23.2% in Los Angeles, and 2.4% in Miami. Additional results are summarized in Exhibit 1 at page 1. Specifically, the TexCote SuperCore Gray paint has a bigger impact on lowering cooling energy in Los Angeles than in Miami. Furthermore, the TexCote SuperCore Gray paint has a bigger impact on annual cooling energy savings when walls have less insulation. Maximum energy savings occur in summer (May-September) when cooling is most required. The results of these analyses, obtained prior to January 2004, demonstrate the striking decrease in energy cost when using the paints of my invention in comparison to other paints which lack at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure of my invention.

15. Subsequent to the filing of the patent application, Textured Coatings of America, Inc. engaged in a cooperative research project with Oak Ridge National Laboratory (ORNL) of the United States Department of Energy in 2004 and 2005 to further confirm the effectiveness of the method of my invention by performing field tests involving walls coated with Textured Coatings of America, Inc. products which contain at least one heat-reflective metal oxide pigment of my invention and "standard color" paint that does not. The project entailed monitoring inside and

outside temperatures and solar radiation levels of homes in various climates, and then using these data to make refined analyses of the cooling costs. The homes were painted with either the paint of my invention, or standard colors which did not contain at least one heat reflective pigment of the invention. Three test sites were used for this research: Phoenix, Jacksonville, and Oak Ridge. Attached hereto as Exhibit 6 is a listing of the solar reflectance data obtained by actual field measurement by ORNL during the course of this project. Referring to Exhibit 6, the term "Platinum" and "Pt" refer to wall paints of my invention having at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure. Paints without the "Platinum" or "Pt" designation refer to paints lacking at least one heat reflective pigment which comprises a solid solution having a corundum-hematite crystal lattice structure. Thus, when applied over primer, the reflectance of Mountain Gray Supercote Platinum is greater than the corresponding Mountain Gray Supercote, having values of 0.440 and 0.304, respectively, as measured at the Phoenix test site. Similarly, when applied over primer, Underseas Supercote Platinum and Underseas Supercote have reflectance values of 0.513, and 0.246, respectively, as measured at the Jacksonville and ORNL (i.e., Oak Ridge) sites. When applied over wood siding at the Jacksonville site, the Underseas Supercote Platinum and Underseas Supercote paints have reflectance values of 0.398 and 0.237, respectively. Finally, when applied over stucco at the Oak Ridge site, Underseas Supercote Pt and Underseas Supercote have reflectance values of 0.495 and 0.238, respectively. Thus, in all cases the incorporation of at least one heat reflective metal oxide pigment which comprises a solid solution having a corundum-hematite crystal lattice structure resulted in painted buildings having significantly enhanced solar reflectance. These data are completely consistent with and augment the results described in paragraph 10 above. At the Phoenix site, peak temperature differences at noon in cool versus standard coated walls approached 36 °F. At the Jacksonville site, peak temperature differences at noon in cool versus standard coated walls approached 6 °F. At the Oak Ridge site, peak temperature differences at 3 PM in cool versus standard coated walls approached 16 °F. Based on these data, a computer model clearly shows energy savings of 4 to 9 % for "cool" (i.e., infrared reflective) paints compared to standard colors. These results further

confirm the results of the analyses disclosed in the patent application and in paragraph 11-13 above, and further show the effectiveness of the methods of my invention.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements are so made punishable by fine or imprisonment, or both, under Section 101 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

5-1-06
Date

Jay A. Haines

Attachments:

- Exhibit 1: Memorandum regarding Supercore textured coatings energy saving calculations, dated January 2, 2003
- Exhibit 2: Photograph of a residence, painted prior to January 2004.
- Exhibit 3: Memorandum from PRI Asphalt Technologies, dated prior to January 2004.
- Exhibit 4: Invoice from Tavco Chemicals Incorporated, dated prior to January 2004.
- Exhibit 5: Production ticket of Textured Coatings of America, Inc. showing manufacture of lot 31117-229 of Tex Cote Platinum SuperCote Antique Ivory paint, prior to January 2004.
- Exhibit 6: Solar Reflectance of Coatings determined by Oak Ridge National Laboratory

Exhibit 1: Memorandum from Eley Associates regarding Supercore textured coatings energy saving calculations, dated prior to January 2004.

MEMORANDUM

To: Eileen Dutton, Textured Coatings of America

From: Aditi Raychoudhury, Eley Associates

Cc: Tianzhen Hong, Eley Associates

Subject: Supercore textured coatings energy saving calculations

This memo includes results and methodology for calculating the energy savings of Tex Cote SuperCore Gray textured coating compared to Competitor high quality gray coating when they are applied to the outside surfaces of side walls of a residential house in two climate locations – Los Angeles and Miami.

Tex Cote SuperCore Gray coating has an absorptance of 0.497, Competitor High Quality Gray has an absorptance of 0.732. Both coatings have an emissivity of 0.88.

Summary

The analysis is done for a 45' x 45' single family, single story, detached home.

- Tex Cote SuperCore Gray shows lower cooling energy requirement than competitor high quality gray in both climate zones
- Tex Cote SuperCore Gray has a bigger impact on lowering cooling energy in Los Angeles than in Miami
- Tex Cote SuperCore Gray has a bigger impact on annual cooling energy savings when walls have less insulation. For walls that are well insulated the impact on cooling energy is small.
- Tex Cote SuperCore Gray saves 1,420 kWh (24%) in annual cooling energy in Los Angeles and 272 kWh (2.3%) in Miami compared with Competitor High Quality Gray
- Maximum energy savings occur in summer (May – September) when cooling is most required
- The difference in heating energy requirement for both coatings in Miami, Florida is insignificant
- The annual heating energy in Los Angeles, California increases by 35 Therms (16%). If typical residential utility rate for electricity is $0.13/kWh and $0.70/Therm for gas in Los Angeles is used for calculating energy cost, the increase in annual heating energy cost is $24.50 while the reduction of annual electricity cost is $184.60, which shows annual net savings of $160.10.

Based on this analysis, the followings are also observed:

- Tex Cote SuperCore Gray is more effective in saving cooling energy in climates where cooling is required for majority of the year.
- Tex Cote SuperCore Gray is more effective in saving cooling energy when applied to walls with less insulation. If a wall is well insulated, increase in reflectance has marginal effect because the wall has a low U-value which controls the conduction heat transfer through the outside and inside surfaces of the wall.

Page 3

Wall construction:	Fully grouted CMU walls with 1" stucco (Los Angeles, California)
	Wood framed walls with R-11 batt insulation (Miami, Florida)
Roof construction:	Wood famed roof, R-30 batt insulation, 70% absorptance.

Internal loads

Number of people:	4
Lighting Power Density:	0.80 watts/s.f.
Equipment Power Density:	0.75 watts/s.f.
Infiltration:	0.3 ACH (air changes per hour)

HVAC system

Cooling thermostat set point:	76 °F
Heating thermostat set point:	68 °F
Operating schedule:	24-hr heating/cooling
System type:	Residential system

Weather data

TMY2 hourly weather data (http://rredc.nrel.gov/solar/ old_data/nsrdb/tmy2/) was used for simulation.

Los Angeles, California: California climate zone 8.

Miami, Florida: Miami weather file.

Table 3: Weather data summary for California climate zone 8

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
AVG. TEMP. (F) (DRYBULB)	54.7	56.2	57.6	60.6	63.6	67.4	70.9	70.8	70.1	65.4	59.4	55.7	62.7
AVG. TEMP. (F) (WETBULB)	46.5	50.0	51.5	51.8	57.2	62.0	63.6	64.0	59.6	59.9	52.6	48.5	55.5
AVG. DAILY MAX. TEMP.	67.5	69.0	69.1	72.3	74.2	78.4	82.9	84.0	83.2	79.0	73.4	68.4	75.2
AVG. DAILY MIN. TEMP.	45.0	48.5	48.2	50.3	55.0	58.6	61.4	62.0	60.5	55.7	48.9	44.7	53.1
AVG. DAILY DIRECT NORMAL SOLAR (Btu/sf/day)	1,683.2	1,701.5	1,978.3	1,916.2	1,828.4	2,050.0	2,337.8	2,102.7	1,710.9	1,593.0	1,488.3	1,405.6	1,815.7
AVG. DAILY TOTAL HORIZNTL SOLAR (Btu/sf/day)	993.1	1,232.9	1,626.4	1,922.2	2,113.1	2,224.8	2,368.0	2,143.2	1,719.8	1,375.1	1,039.8	872.5	1,638.3
MAX. DAILY DIRECT NORMAL SOLAR (Btu/sf/day)	2,308.0	2,495.0	2,853.0	3,044.0	2,999.0	3,041.0	2,932.0	2,646.0	2,490.0	2,299.0	1,995.0	2,062.0	3,044.0
MAX. DAILY TOTAL HORIZNTL SOLAR (Btu/sf/day)	1,215.0	1,644.0	2,082.0	2,393.0	2,610.0	2,681.0	2,619.0	2,410.0	2,087.0	1,817.0	1,251.0	1,024.0	2,681.0
MIN. DAILY DIRECT NORMAL SOLAR (Btu/sf/day)	70.0	38.0	86.0	59.0	86.0	64.0	387.0	1,007.0	47.0	485.0	22.0	2.0	2.0
MIN. DAILY TOTAL HORIZNTL SOLAR (Btu/sf/day)	498.0	477.0	601.0	1,016.0	1,188.0	1,014.0	1,239.0	1,744.0	797.0	936.0	391.0	280.0	280.0

Table 4: Weather data summary for Miami, Florida

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
AVG. TEMP. (F) (DRYBULB)	68.0	69.4	70.9	76.1	78.4	81.1	82.3	82.2	80.4	77.1	73.8	69.1	75.6
AVG. TEMP. (F) (WETBULB)	62.6	63.1	63.7	67.0	72.3	73.9	76.0	75.3	74.8	71.4	68.7	62.4	69.1
AVG. DAILY MAX. TEMP.	75.7	75.8	77.3	82.1	84.0	87.2	87.8	87.3	86.8	82.6	79.0	76.0	81.9
AVG. DAILY MIN. TEMP.	60.4	62.8	64.2	70.0	73.1	76.3	77.3	77.8	75.2	72.2	68.0	61.8	69.9
AVG. DAILY DIRECT NORMAL SOLAR (Btu/sf/day)	1,271.0	1,469.5	1,529.7	1,684.0	1,469.5	1,155.8	1,254.9	1,152.6	1,115.8	1,206.3	1,165.4	1,201.0	1,306.9
AVG. DAILY TOTAL HORIZNTL SOLAR (Btu/sf/day)	1,107.7	1,403.5	1,634.7	1,954.1	1,911.3	1,826.5	1,900.0	1,797.1	1,557.9	1,385.6	1,131.2	1,065.8	1,556.8
MAX. DAILY DIRECT NORMAL SOLAR (Btu/sf/day)	2,837.0	3,047.0	3,185.0	2,893.0	3,005.0	2,031.0	2,202.0	1,800.0	2,256.0	2,775.0	2,075.0	2,510.0	3,185.0
MAX. DAILY TOTAL HORIZNTL SOLAR (Btu/sf/day)	1,603.0	2,029.0	2,238.0	2,427.0	2,485.0	2,378.0	2,380.0	2,325.0	2,112.0	1,989.0	1,508.0	1,381.0	2,485.0
MIN. DAILY DIRECT NORMAL SOLAR (Btu/sf/day)	23.0	90.0	25.0	114.0	4.0	236.0	115.0	265.0	17.0	-	140.0	174.0	-
MIN. DAILY TOTAL HORIZNTL SOLAR (Btu/sf/day)	346.0	621.0	805.0	930.0	999.0	981.0	1,125.0	864.0	590.0	626.0	646.0	636.0	346.0

Why coatings of walls have impact on cooling energy of a house

The cooling loads of a house comes from the internal loads like lighting, equipment and occupants, and the external loads due to air infiltration, solar heat gains through windows, heat conduction through windows, walls, roofs and floors. The solar radiation on the walls are partly reflected and partly absorbed. The higher the reflectance, the lower the absorptance. With the same location and orientation of a wall, when coatings with lower absorptance are applied to exterior surface of the wall, it will absorb less solar energy and have a lower surface temperature, which lowers the heat transfer through the wall, and thus lower the cooling loads of the space.

Results

The following table summarizes the energy results for cooling and supply fan.

Table 1: Annual cooling and fan energy for both coatings in both climate zones

Case	Cooling Energy (kWh)	Fan Energy (kWh)	Total (kWh)	Percentage savings (%)
Los Angeles, California				
Competitor high quality gray	5,903	1,782	7,685	
Tex Cote SuperCore Gray	4,483	1,407	5,890	
Savings	1,420 (24%)	356	1,775	23.2%
Miami, Florida				
Competitor high quality gray	11,026	2,582	14,218	
Tex Cote SuperCore Gray	11,354	2,526	13,882	
Savings	272 (2.3%)	64	336	2.4%

Table 2: Monthly cooling and fan energy for both coatings in both climate zones

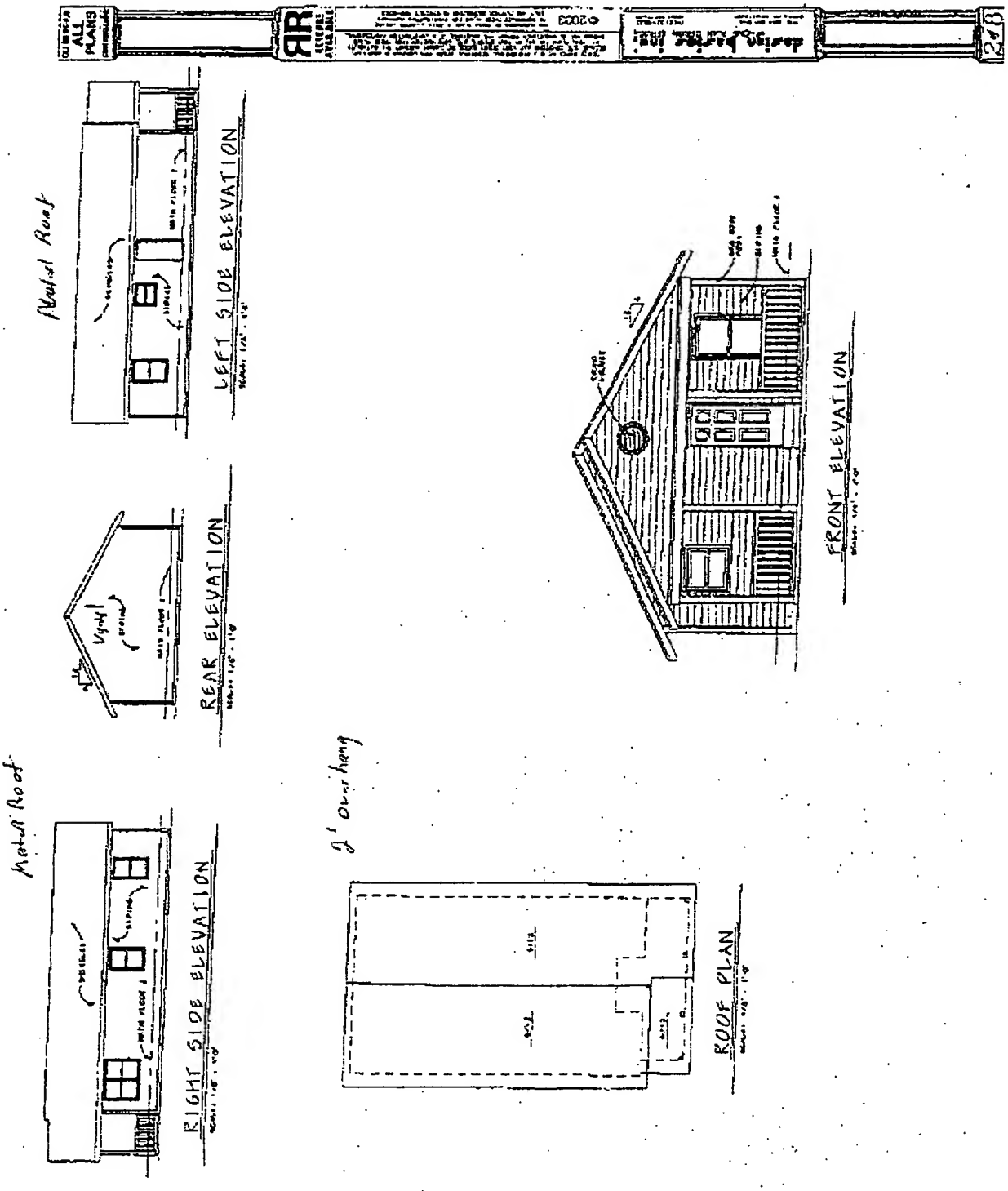
Case	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Los Angeles, California												
Competitor high quality gray	1,016	950	1,150	1,214	1,429	1,814	2,001	1,966	1,793	1,504	1,056	950
Tex Cote SuperCore Gray	922	855	1,004	1,070	1,257	1,435	1,795	1,768	1,602	1,330	953	877
Savings	94	95	146	144	172	179	206	198	191	174	103	73
Miami, Florida												
Competitor high quality gray	690	652	906	1,178	1,454	1,545	1,767	1,742	1,433	1,276	922	859
Tex Cote SuperCore Gray	665	628	879	1,149	1,425	1,513	1,736	1,712	1,403	1,246	898	835
Savings	25	24	26	27	29	32	31	30	30	30	24	24

Methodology and Model Assumptions

This analysis is done for a typical single family, single story, detached home using VisualDOE 3.1. VisualDOE 3.1 is a windows interface to the hourly building energy simulation program DOE 2.1e, developed by the Lawrence Berkeley National laboratory. DOE2.1e is a whole building energy analysis program that uses hourly weather data to calculate energy consumption due to internal and external loads. The following assumptions are made for the energy model.

Envelope

Size of dwelling unit:	45' x 45' x 10' (2,025 s.f.)
Window area:	4' x 5' x 4 for each façade
Total window area:	320 s.f. (16% of floor area)
Glazing type:	Single clear glazing with aluminum frame (U=1.25, SHGC=0.76, VT=0.74)


ALL PLANS
RR
Metal Roof
LEFT SIDE ELEVATION
REAR ELEVATION
Vinyl
FRONT ELEVATION
Metal Roof
RIGHT SIDE ELEVATION
2' Overhang
ROOF PLAN

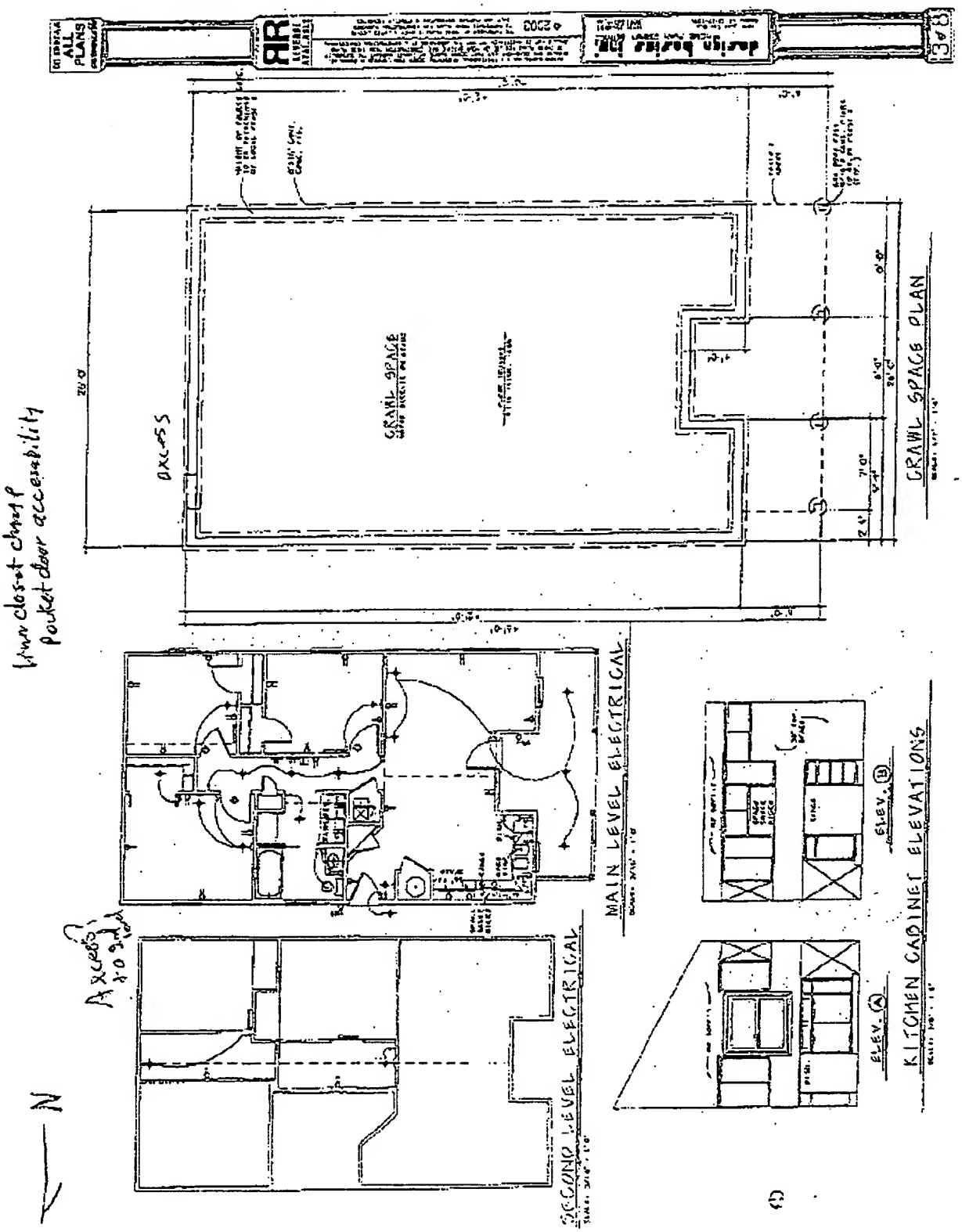

CRAWL SPACE PLAN
MAIN LEVEL ELECTRICAL
SECOND LEVEL ELECTRICAL
KITCHEN CABINET ELEVATIONS
ELEV. A
ELEV. B
Linen closet change
Pocket door accessibility
Access

Exhibit 2: Photograph of a residence, painted prior to January 2004 with Tex Cote SuperCote paint.

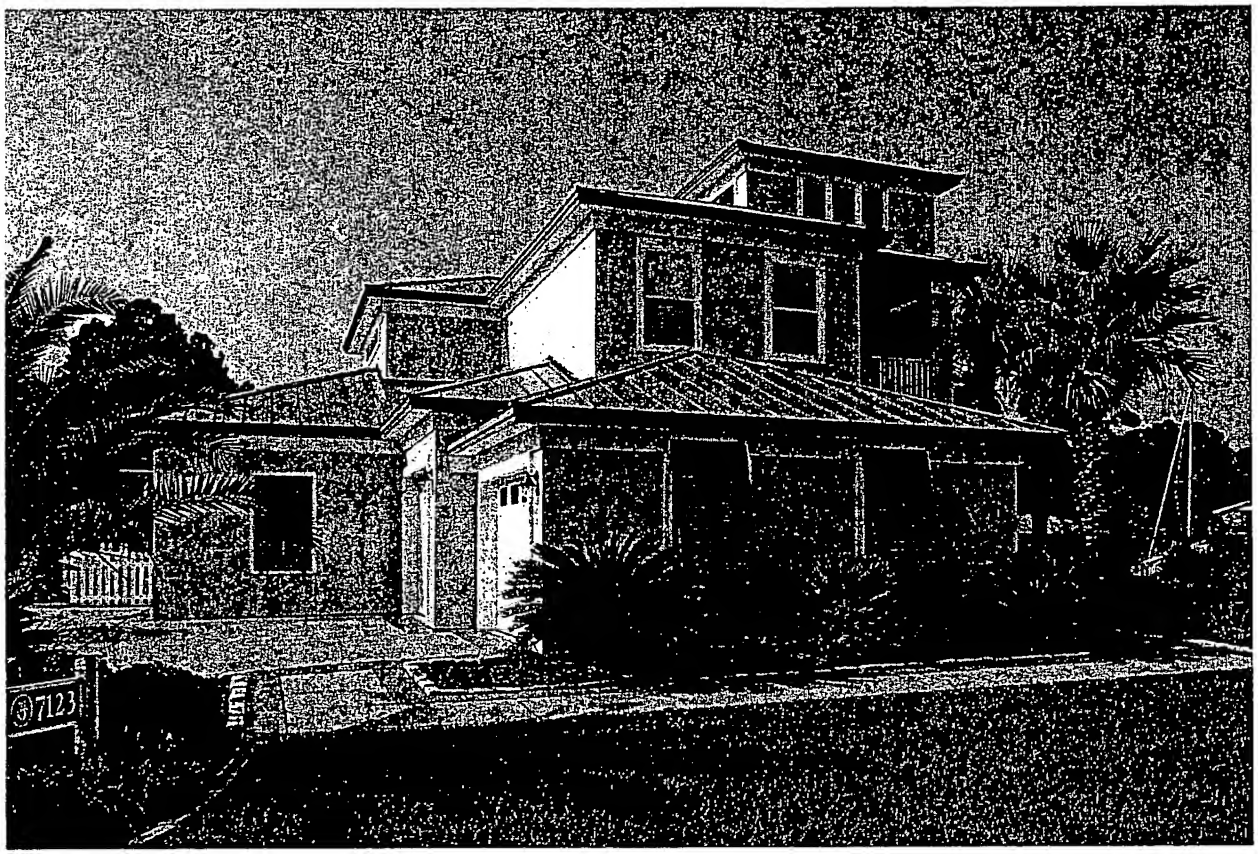

7123

Exhibit 3: Memorandum from PRI Asphalt Technologies, dated prior to January 2004.

ASPHALT
TECHNOLOGIES

Laboratory Report

Report for: Textured Coatings of America, Inc.
2422 East 15th Street
Panama City, FL 32405-6348

Date:

Attention: Eileen Dutton

Purpose: The purpose of this testing was to measured included solar reflectance and infrared emittance of four coated panels.

Materials: The samples for testing were received from Textured Coatings on September 5, 2002. The samples were labeled as follows:

1. Competitor High Quality Gray
2. Tex Cote SuperCote Gray
3. Competitor High Quality Tan
4. Tex Cote SuperCote Tan

Some of the above samples may have contained IR pigments. There is some difficulty in measuring the reflectance of materials containing these pigments. CRRC and Lawrence Berkeley Laboratories have not yet resolved this issue. There is also some difference in the measurement of solar reflectance for an IR pigment containing specimen between the CRRC portable reflectometer method and the ASTM E 903 integrating sphere measurement.

Test Methods: The test methods used included Draft One – April 2001 of a proposed ASTM Standard: *Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Reflectometer* and ASTM C 1371: *Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.*

PRI Asphalt Technologies, Inc. 9408 Badger Drive Tampa, FL 33610 Tel: 813-621-0777 Fax: 813-621-6840 e-mail: mail@priasphalt.com Web Site: http://www.priasphalt.com

Textured Coatings of America, Inc.
Laboratory Report for Tex Cote and Competitor Coatings
TCOA-001-02-01

Page 2 of 2

Results of Testing: All measurements were conducted at laboratory conditions of 23 ± 2°C and 50 ± 5 percent relative humidity. The testing was conducted on September 11, 2002.

Reflectance

Material ID	Test Method	Result, Reflectance, Air Mass = 1.5					
Specimen No.		1	2	3	Avg.	SD	95% CI
Competitor HQ Gray	CRRC	26.8	26.8	27.0	26.8	0.200	0.50
Tex Cote SuperCote Gray	CRRC	50.3	50.2	50.3	50.3	0.055	0.14
Competitor HQ Tan	CRRC	38.9	38.3	38.2	38.5	0.379	0.94
Tex Cote SuperCote Tan	CRRC	49.9	49.8	49.9	49.9	0.057	0.14

Note: Reflectance measurements were conducted using a Devices and Services SSR-ER Version 5.0 reflectometer calibrated with Devices and Services Reference Standard: 0.807.

Emittance

Material ID	ASTM Test Method		Emittance, ε					
Specimen No.		Thickness, in	1	2	3	Avg.	SD	95% CI
Competitor HQ Gray	C 1371	0.002	0.89	0.88	0.88	0.88	0.006	0.01
Tex Cote SuperCote Gray	C 1371	0.002	0.89	0.88	0.88	0.88	0.006	0.01
Competitor HQ Tan	C 1371	0.002	0.87	0.89	0.88	0.88	0.010	0.02
Tex Cote SuperCote Tan	C 1371	0.002	0.88	0.88	0.88	0.88	–	–

Note: Emittance measurements were conducted using a Devices and Services Emissometer Model AE calibrated with Devices and Services Reference Standards: High Emittance: 0.90 and Low Emittance: 0.08.
Room Temperature: 23.2°C

Signed: _____
Donald E. Portfolio
Vice - President

Date: ___

PRI Asphalt Technologies, Inc. 6406 Badger Drive Tampa, FL 33610 Tel: 813-621-8777 Fax: 813-621-4840 e-mail mail@priasphalt.com WebSite: http://www.priasphalt.com

Exhibit 4: Invoice from Tavco Chemicals Incorporated, dated prior to January 2004.

Tavco Chemicals Incorporated
P. O. Box 6478
Laguna Niguel, Ca. 92607-6478
Phone: 949-770-7666
Fax: 949-770-8889

INVOICE

INVOICE NO: 0027569-IN
INVOICE DATE:
SALES ORDER: 0013286
ORDER DATE:

Page: 1

SOLD TO:

TEXTURED COATINGS OF AMERICA
2422 EAST 15TH STREET
PANAMA CITY, FL 32405

SHIP TO:

TEXTURED COATINGS
5950 SOUTH AVALON
LOS ANGELES, CA 90003

MA

CUSTOMER P.O.	SHIP VIA	F.O.B.	TERMS
18483	DELIVERED	LOS ANGELES	90 DAY TERMS PER KEITH VENIA

ITEM NO.	DESCRIPTION	UNIT	ORDERED	SHIPPED	BCK ORD	PRICE	AMOUNT
TC CMD3137 TC	CMD3137 AQUECUS V-9416 YELLOW	LB	97.00	97.00	0.00		
	LOT DISTRIBUTION: PO # 3843						
TC CMD5041 TC	CMD5041 AQUECUS V12500 CAM GRN	LB	240.00	240.00	0.00		
	LOT DISTRIBUTION: PO # 3843						
TC CMD6077 TC	CMD6077 AQUEOUS V9248 BLUE	LB	240.00	240.00	0.00		
	LOT DISTRIBUTION: PO # 3843						
TC CMD3138 TC	CMD3138 AQU V-10415 ATM GOLD	LB	480.00	480.00	0.00		
	LOT DISTRIBUTION: PO # 3843						

NO CODE NEEDED.

*******PLEASE NOTIFY TAVCO OF*********
SHIP DATE & FAX THE B/L AS SOON AS PRODUCT SHIPS.
TAVCO'S FAX # IS 949-770-8889

RECEIVED
040137

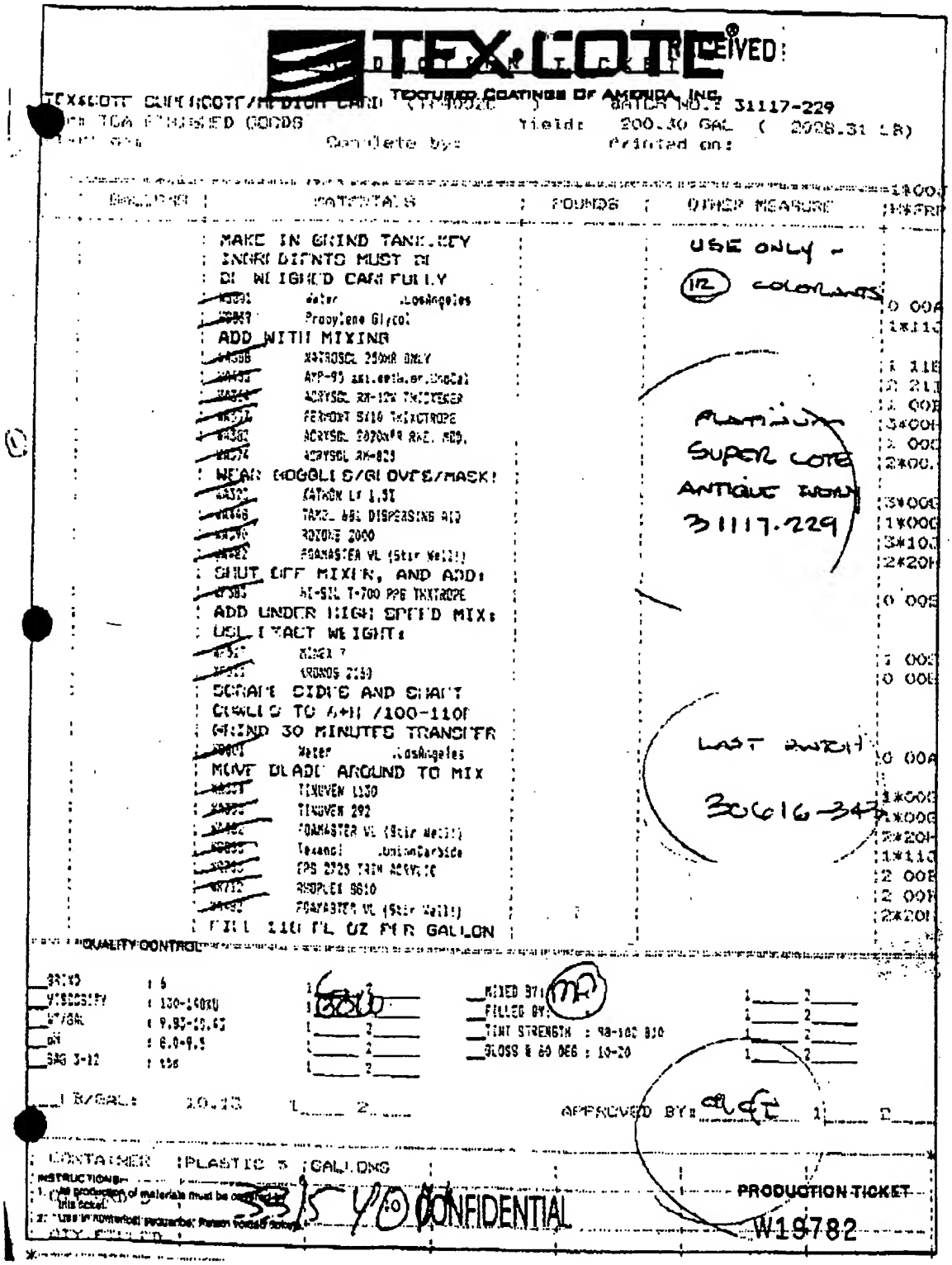
027662
ACCOUNTS PAYABLE
INVOICE DATE
INPUT DATE
RECEIVING DATE
4203/00W/TC

Please Note: a Monthly 1.5% Finance Charge of $ 124.93 will be added to this invoice if past due.

CUSTOMER

INVOICE TOTAL:

Exhibit 5: Production ticket of Textured Coatings of America, Inc. showing manufacture of lot 31117-229 of Tex Cote Platinum SuperCote Antique Ivory paint, prior to January 2004.



TEX-COTE®

TEXTURED COATINGS OF AMERICA, INC.

RECEIVED

TEX&COTT CUSTOM/HIGH END (TX-40026) BATCH NO.: 31117-229

TGA FINISHED GOODS Yield: 200.30 GAL (2008.31 LB)

Complete by: Printed on:

SEQUENCE	MATERIALS	POUNDS	OTHER MEASURE
	MAKE IN GRIND TANK ONLY		USE ONLY -
	INGREDIENTS MUST BE		(12) COLORANTS
	BE WEIGHED CAREFULLY		
	Water Los Angeles		
	Propylene Glycol		
	ADD WITH MIXING		
	ATTAGEL 250HR ONLY		
	ATP-95 anti-settler/modifier		
	ACRYSOL RM-12W THICKENER		
	VERMONT 5/10 THIXOTROPE		PLATINUM
	ACRYSOL 2020NPR RAIN RES.		SUPER COTE
	ACRYSOL RM-825		ANTIQUE IVORY
	WEAR GOGGLES/GLOVES/MASK!		31117-229
	ATAGEL LF 1.5%		
	TAMOL 681 DISPERSING AID		
	ROZONE 2000		
	FOAMASTER VL (Stir Well!)		
	SHUT OFF MIXER, AND ADD:		
	AT-SIL T-700 PPG THIXTROPE		
	ADD UNDER HIGH SPEED MIX:		
	USE EXACT WEIGHTS		
	ROZONE 7		
	KRONOS 2310		
	SCRAPE SIDES AND SHAFT		
	GRIND TO 4+H /100-110F		
	GRIND 30 MINUTES TRANSFER		
	Water Los Angeles		LAST BATCH
	MOVE BLADE AROUND TO MIX		30616-34
	TINUVEN 1130		
	TINUVEN 292		
	FOAMASTER VL (Stir Well!)		
	Texanol Eastman Chemical		
	EPS 2725 THIN ACRYLIC		
	RHOPLEX 9810		
	FOAMASTER VL (Stir Well!)		
	FILL 110 FL OZ PER GALLON		

QUALITY CONTROL

GRIND	6	1 2	MIXED BY: (MP)	1 2	
VISCOSITY	100-110KU	1 88KU	FILLED BY:	1 2	
#/GAL	9.97-10.03	1 2	TINT STRENGTH : 98-102 B30	1 2	
pH	8.0-9.5	1 2	GLOSS @ 60 DEG : 10-20	1 2	
SAG 3-12	6%	1 2			

LB/GAL: 10.13 1 2 APPROVED BY: 1 2

CONTAINER: PLASTIC 5 GALLONS

INSTRUCTIONS:

1. All production of materials must be completed within this scope.
2. Use of Alternate Packaging: Reason noted below.

CONFIDENTIAL

PRODUCTION TICKET

W19782

Exhibit 6: Solar Reflectance of Coatings determined by Oak Ridge National Laboratory

Solar Reflectance of Coatings

- **Samples over primer: Mountain Gray (Phoenix) and Underseas (Jacksonville and ORNL) 7/2/04**

Mountain Gray Supercote Platinum	0.440
Mountain Gray Supercote	0.304
Underseas Supercote Platinum	0.513
Underseas Supercote	0.246

- **Jacksonville on wood siding and existing coating 12/8/04**

Underseas Supercote Platinum	0.398
Underseas Supercote	0.237

- **ORNL on stucco**

	8/4/04	9/27/04	5/18/05	8/3/05	
Texcote Primer	0.713	0.668	0.716	0.664	
Underseas Supercote Pt	0.493	0.501	0.493	0.494	0.495
Underseas Supercote	0.238	0.242	0.235	0.239	0.238

Use averages

OAK RIDGE NATIONAL LABORATORY
U. S. DEPARTMENT OF ENERGY

UT-BATTELLE